



Integral Consulting Inc.
7030 E. Genesee Street
Suite 105
Fayetteville, NY 13066

telephone: 315.446.5090
www.integral-corp.com

March 29, 2017

Project No. CF1716-06

Lawrence Granite
USEPA Region 2
290 Broadway
Mail Code: 19TH FL
New York, NY 10007-1866
Letter sent via email to: Granite.larry@epa.gov

Subject: PFASs Detected at Matteo & Sons Superfund Site in New Jersey

Dear Mr. Granite:

This letter follows up on our recent conversations regarding measurements of perfluoroalkyl substances (PFASs) in a private well located at 1692 Crown Point Road in West Deptford (Thorofare), NJ, which is the location of the 80-acre Matteo & Sons, Inc. Superfund site (i.e., OU-1) for which you are providing regulatory oversight. As you are aware, this site operated as a landfill until 1984. Subsequent operations included a junkyard and metals recycling facility. These types of operations are known to potentially contribute releases of PFASs, including perfluorononanoic acid (PFNA), and other compounds to groundwater:

- **Landfills:** Numerous studies have demonstrated that landfill leachate can be an ongoing source of PFAS loadings to watersheds (OECD 2002; Kallenborn et al. 2004; Woldegiorgis et al. 2006; Clara et al. 2008; Busch et al. 2010; Eggen et al. 2010; Huset et al. 2011; Benskin et al. 2012; Li et al. 2012; Clark et al. 2015).
- **Chrome plating:** The use of products containing PFNA and other PFASs for chrome plating operations was one of the exemptions from the Significant New Use Rules (SNURs) enacted by USEPA. Therefore, discharges from facilities that use or recycle these materials can contribute PFASs to the environment. For example, the source of high concentrations of perfluorooctanesulfonic acid (PFOS) in a waste water treatment plant (WWTP) was traced back to a large chrome plating operation that used a surfactant product and discharged to the WWTP (Kelly and Solem, 2007).

The well at the Matteo & Sons property was sampled by Integral Consulting, Inc. (Integral) on behalf of Solvay Specialty Polymers USA, LLC (Solvay) as part of a broader investigation of PFAS compounds in private wells in West Deptford, NJ. The investigation was initiated in 2014 in consultation with USEPA Region 2 and NJDEP and all results have been shared with the agencies and home owners and/or occupants.

Results for all of the samples collected at 61 residences in 2014 and 2015 are summarized in Table 1 and sorted in descending order of concentrations of PFNA. Addresses are excluded from the table to preserve the privacy of participants, however, Figure 1 shows the locations of the full set of wells sampled and the tax parcel for the Matteo & Sons property. The following concentrations of perfluorooctanoic acid (PFOA), PFOS, and PFNA were detected in the sample collected from the well at the Matteo & Sons property:

- PFOA = 65 parts per trillion (ppt)
- PFOS = 34 ppt
- PFNA = 650 ppt

These concentrations are among the highest measured in private wells in the area. In addition, the sum of PFOA and PFOS (i.e., 99 ppt) exceeds the current USEPA Health Advisory for drinking water of PFOA + PFOS of 70 ppt.

The historic operations at the Matteo & Sons property, the evidence of soil-to-groundwater leaching of numerous other contaminants, and the recent detections of disproportionately elevated concentrations of PFAS are all pointing to this property being a likely source of PFAS in groundwater in West Deptford. Further sampling and source investigation for PFAS at this property would be appropriate.

The following individuals have participated in planning meetings for the PFAS investigation and have received copies of all data reports:

- Nidal Azzam, azzam.nidal@epa.gov, phone: 212-637-3748
- Andrew Park, park.andrew@epa.gov, phone: 212-637-4184
- Erica Bergman, erica.bergman@dep.state.nj.us, phone: 609-292-7406; NJDEP case manager for Solvay PFAS investigation
- Tom Buggey, tbuggey@rouxinc.com; phone: 856-832-3742; LSRP for Solvay PFAS investigation

As we discussed, a copy of this letter will also be sent by email to the following:

- Fred Mumford, fred.mumford@dep.state.nj.us; NJDEP contact for RI activities at Matteo & Sons

Please let me know if I can answer any questions or provide any additional information regarding the sample results for the well at Matteo & Sons property. I can be reached via email at pgoodrum@integral-corp.com, and by phone at 315-396-6655.

Sincerely,

A handwritten signature in dark ink, appearing to read "Phil Goodrum". The signature is fluid and cursive, with the first name "Phil" and last name "Goodrum" clearly distinguishable.

Philip Goodrum, Ph.D., DABT
Senior Consultant

cc:

Nidal Azzam, USEPA Region 2
Andrew Park, USEPA Region 2
Fred Mumford, NJDEP
Erica Bergman, NJDEP
Tom Bugey, LSRP, Roux Associates
Mitch Gertz, Solvay Specialty Polymers USA, LLC

Enclosures:

References cited, Table 1, and Figure 1

REFERENCES

- Benskin, J.P., B. Li, M.G. Ikononou, J.R. Grace, and L.Y. Li. 2012. Per- and polyfluoroalkyl substances in landfill leachate: Patterns, time trends, and sources. *Environ. Sci. Technol.* 46(21):11532-11540.
- Busch, J., L. Ahrens, R. Sturm, and R. Ebinghaus. 2010. Polyfluoroalkyl compounds in landfill leachates. *Environ. Pollut.* 158:1467-1471.
- Clara, M., S. Scharf, S. Weiss, O. Gans, and C. Scheffknecht. 2008. Emissions of perfluorinated alkylated substances (PFAS) from point sources-identification of relevant branches. *Water Sci. Technol.* 58(1):59-66.
- Clark, B.O., T. Anumol, M. Barlaz, and S.A. Snyder. 2015. Investigating landfill leachate as a source of trace organic pollutants. *Chemosphere.* 127:269-275.
- Eggen, T., M. Moeder, and A. Arukwe. 2010. Municipal landfill leachates: A significant source for new and emerging pollutants. *Sci. Tot. Environ.* 408(21):5147-5157.
- Huset, C.A., M.A. Barlaz, D.F. Barofsky, and J.A. Field. 2011. Quantitative determination of fluorochemicals in municipal landfill leachates. *Chemosphere.* 82(10):1380-1386.
- Kallenborn, R., U. Berger, and U. Järnberg. 2004. Perfluorinated alkylated substances (PFAS) in the Nordic environment. TemaNord 2004:552. Nordic Council of Ministers, Copenhagen, Denmark. 112 pp.
- Kelly, J. and L. Solem. 2007. Identification of a Major Source of Perfluorooctane Sulfonate (PFOS) at a Wastewater Treatment Plant in Brainerd, Minnesota. Minnesota Department of Health.
- Li, B., M.N. Dannon-Schaffer, L.Y. Li, M.G. Ikononou, and J.R. Grace. 2012. Occurrence of PFCs and PBDEs in landfill leachates from across Canada. *Water Air Soil Pollut.* 223:3365-3372.
- OECD. 2002. Hazard assessment of perfluorooctane sulfonate (PFOS) and its salts. ENV/JM/RD(2002)17/FINAL. JT00135607. Organisation for Economic Co-operation and Development, Environment Directorate. 362 pp. November 21. Available at: www.oecd.org/dataoecd/23/18/2382880.pdf.
- Woldegiorgis, A., J. Anderson, M. Remberger, L. Kaj, Y. Ekheden, L. Blom, E. Brorström-Lundén, A. Borgen, C. Dye, and M. Schlabach. 2006. Results from the National Swedish Screening Programme 2005. Subreport 3: Perfluorinated alkylated substances (PFAS). IVL Report B1698. IVL Swedish Environmental Research Institute Ltd., Stockholm, Sweden. 48 pp. November 20.

Table 1. Perfluoroalkyl substance (PFAS) sampling of residential drinking water wells at n=61 residences in West Deptford Township, New Jersey during 2014-2015. Street addresses are removed to protect the privacy of owner/occupants, however, all data have been shared with owner/occupants as well as West Deptford Township, USEPA, and NJDEP.

Count	Easting (ft) ^a	Northing (ft) ^a	Sample Date	Distance to Matteo & Sons Site (meters) ^b	PFOA (ppt)	PFOS (ppt)	PFOA + PFOS (ppt) ^c	PFNA (ppt)
1	303235	365415	5/20/14	2,324	500	0.33 <i>J</i>	500	1,500
2	303749.284	373021.492	6/17/14	0 (on-site well)	65	34	99	650
3	303276	365233	5/20/14	2,379	490	0.22 <i>J</i>	490	640
4	303009	365161	5/20/14	2,407	190	ND <i>U</i>	190	230
5	299829	360790	7/17/14	3,915	20	5	25	190
6	299841	360938	6/5/14	3,871	16	4.4	20.4	140
7	299841	360938	6/5/14	3,871	16	4.4	20.4	140
8	299684	360734	6/5/14	3,945	16	2.6	18.6	120
9	294872	361230	5/20/14	4,498	13	1.6 <i>J</i>	14.6	100
10	300580.0187	379609.9765	6/3/14	2,227	22	7	29	79
11	297229	358439	6/4/14	4,869	7	0.55 <i>J</i>	7.6	56
12	297209	358653	6/4/14	4,812	8	0.43 <i>J</i>	8.4	52
13	295647	357810	6/6/14	5,253	6.6	1.5 <i>J</i>	8.1	39
14	285507	364282	5/21/14	6,164	6.8	4.1	10.9	34
15	306122.178	361691.115	7/9/14	3,529	5	ND <i>U</i>	<5.2	29
16	298485.5	358745.1	9/11/15	4,638	9.6	ND <i>U</i>	<9.8	28
17	298485.5	358745.1	9/11/15	4,638	9.6	ND <i>U</i>	<9.8	28
18	298594	358674	8/12/15	4,647	8.2	ND <i>U</i>	<8.4	28
19	298594	358674	8/12/15	4,647	8.2	ND <i>U</i>	<8.4	28
20	294512	360518	8/4/15	4,738	5.4	0.71 <i>J</i>	6.1	28
21	296469	358621	6/3/14	4,918	3.9	0.46 <i>J</i>	4.4	16
22	296376	358355	6/4/14	5,003	3	0.39 <i>J</i>	3.4	16
23	306187	360792	6/17/14	3,802	2.6	ND <i>U</i>	<2.8	16
24	295816	357914	6/4/14	5,201	3.5	0.88 <i>J</i>	4.4	14
25	300513	358465	6/5/14	4,545	2.9	ND <i>U</i>	<3.1	14
26	299666	365060	7/9/14	2,727	9.2	ND <i>U</i>	<9.4	13
27	295589.792	357714.94	12/5/14	5,287	3.6 <i>JB</i>	0.87 <i>J</i>	4.5	13
28	298224.9	355479.1	6/19/14	5,606	4.8	0.61 <i>J</i>	5.4	9
29	294764.656	360650.301	6/3/14	4,660	2.6	0.24 <i>J</i>	2.8	7.1
30	306190.275	361819.269	6/4/14	3,495	0.89 <i>J</i>	ND <i>U</i>	<1.09	3
31	302394.9	361592.8	5/21/14	3,508	2.6	2 <i>J</i>	4.6	1.2 <i>J</i>
32	296003	358024	6/11/14	5,145	3.1	1.6 <i>J</i>	4.7	1 <i>J</i>
33	294806	356939	5/20/14	5,609	0.72 <i>J</i>	ND <i>U</i>	<0.92	0.88 <i>J</i>
34	294790.158	356980.996	5/20/14	5,600	0.91 <i>J</i>	ND <i>U</i>	<1.11	0.75 <i>J</i>
35	298541.718	355327.188	5/20/14	5,622	1.7 <i>J</i>	0.29 <i>J</i>	2.0	0.69 <i>J</i>
36	294351	358160	5/20/14	5,359	0.63 <i>J</i>	ND <i>U</i>	<0.83	0.41 <i>J</i>
37	297702	356806	5/20/14	5,275	1.1 <i>J</i>	ND <i>U</i>	<1.3	ND <i>U</i>
38	298775	355204	5/20/14	5,639	1 <i>J</i>	ND <i>U</i>	<1.2	ND <i>U</i>
39	299827	354670	6/17/14	5,720	0.83 <i>J</i>	ND <i>U</i>	<1.03	ND <i>U</i>
40	296934.862	355773.861	6/26/14	5,653	0.74 <i>J</i>	ND <i>U</i>	<0.94	ND <i>U</i>
41	298207.35	355290.877	5/28/14	5,662	0.73 <i>J</i>	ND <i>U</i>	<0.93	ND <i>U</i>
42	297001	354234	6/10/14	6,085	0.66 <i>J</i>	ND <i>U</i>	<0.86	ND <i>U</i>
43	297987	354298	5/20/14	5,971	0.53 <i>J</i>	ND <i>U</i>	<0.73	ND <i>U</i>
44	294791	357329	6/3/14	5,507	0.52 <i>J</i>	ND <i>U</i>	<0.72	ND <i>U</i>
45	298427	354474	5/23/14	5,882	0.52 <i>J</i>	ND <i>U</i>	<0.72	ND <i>U</i>
46	294850	357125	5/23/14	5,553	0.5 <i>BR</i>	ND <i>U</i>	<0.7	ND <i>U</i>
47	298245	354229	5/20/14	5,969	0.5 <i>J</i>	ND <i>U</i>	<0.7	ND <i>U</i>
48	294779	357279	5/28/14	5,522	0.49 <i>BR</i>	ND <i>U</i>	<0.69	ND <i>U</i>

Table 1. Perfluoroalkyl substance (PFAS) sampling of residential drinking water wells at n=61 residences in West Deptford Township, New Jersey during 2014-2015. Street addresses are removed to protect the privacy of owner/occupants, however, all data have been shared with owner/occupants as well as West Deptford Township, USEPA, and NJDEP.

Count	Easting (ft) ^a	Northing (ft) ^a	Sample Date	Distance to Matteo & Sons Site (meters) ^b	PFOA (ppt)	PFOS (ppt)	PFOA + PFOS (ppt) ^c	PFNA (ppt)
49	294898	357024	5/21/14	5,572	0.48 <i>BR</i>	ND <i>U</i>	<0.68	ND <i>U</i>
50	293927	358501	5/20/14	5,343	0.46 <i>J</i>	ND <i>U</i>	<0.66	ND <i>U</i>
51	299901	352620	6/3/14	6,328	0.44 <i>J</i>	ND <i>U</i>	<0.64	ND <i>U</i>
52	293882	358683	5/20/14	5,305	0.4 <i>J</i>	ND <i>U</i>	<0.6	ND <i>U</i>
53	294828	356819	5/23/14	5,637	0.36 <i>BR</i>	ND <i>U</i>	<0.56	ND <i>U</i>
54	298642	354545	5/20/14	5,843	0.34 <i>J</i>	ND <i>U</i>	<0.54	ND <i>U</i>
55	297312	354212	6/10/14	6,060	0.28 <i>J</i>	ND <i>U</i>	<0.48	ND <i>U</i>
56	294822	357216	5/20/14	5,533	ND <i>U</i>	ND <i>U</i>	<0.4	ND <i>U</i>
57	294743	357121	6/10/14	5,570	ND <i>U</i>	ND <i>U</i>	<0.4	ND <i>U</i>
58	303820.345	353023.879	6/19/14	6,096	ND <i>U</i>	ND <i>U</i>	<0.4	ND <i>U</i>
59	294057	358397	6/3/14	5,347	ND <i>U</i>	ND <i>U</i>	<0.4	ND <i>U</i>
60	304243.839	362476.307	5/28/14	3,218	ND <i>U</i>	ND <i>U</i>	<0.4	ND <i>U</i>
61	303255.6693	362185.8934	5/28/14	3,307	ND <i>U</i>	ND <i>U</i>	<0.4	ND <i>U</i>

Notes:

PFAS = perfluoroalkyl substance

ppt = parts per trillion, or nanograms per liter (ng/L)

PFOA = perfluorooctanoic acid (C8)

NJDEP = New Jersey Department of Environmental Protection

PFOS = perfluorooctanesulfonic acid (C8)

USEPA = United States Environmental Protection Agency

PFNA = perfluorononanoic acid (C9)

BR = result is considered an estimate because the constituent was detected at nearly the same concentration in a field blank. As part of a comprehensive data quality protocol, NJDEP recommends using this notation to indicate that the concentration at this low level cannot be reported with confidence.

J = result was detected at or greater than the method detection limit and less than method reporting limit

ND = nondetect

U = result was not detected at the method detection limit (MDL); the value shown is the MDL

^a New Jersey State Plane coordinates.

highest concentration of PFNA (650 ppt).

^c USEPA's current Health Advisory of 70 ppt applies to PFOA and PFOS individually, and as a sum.

